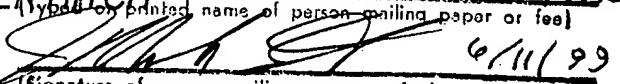


Express Mail No. EL078280365US

"Express Mail" mailing label No. EL078280365US

Date of D. L. 6/11/99

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" (37 CFR 1.37(e)) on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**MOTORCYCLE TRAILER HITCH** J. MARK SMITH #371125  
(Typed or printed name of person mailing paper or fee)  
  
6/11/99  
(Signature of person mailing paper or fee)

5 **FIELD OF THE INVENTION:**

The present invention relates to an assembly for a trailer hitch for motorcycles that allows for easy attachment. Specifically the hitch assembly attaches to the frame of the motorcycle, whether the rear fender is a bob tail, a conventional fender or a low 10 retro style, whether the wheel is a fat tire or not, whether there are side bags or turn signals or not. Further the hitch assembly in some embodiments can be installed such that it is not visible except for the ball hitch hanging down from the particular fender enough to attach and detach. Finally, the hitch does not need supports to the exterior of the wheel or hub. In one embodiment the ball is removably attached.

15

**BACKGROUND OF THE INVENTION:**

The uses of trailers for motorcycles is well known. The methods of attachment have been to attach to the frame or hub by exterior tube frame and by bolts and nuts. The hitch which is quite visible then extends back from the attach point in skirt like 20 form. The hitch is not easily removed and thus becomes a permanent addition to the motorcycle and thus a permanent extension to the rear wheel and fender assembly.

The result of such hitches is a highly visible trailer hitch that is semi-permanent on the motorcycle. This detracts from the line and flowing impression of the bike. It is even more unsightly and incongruous with bob tail or short fender motorcycles. The

**EXHIBIT A**

hitch extends much beyond and below the fender. For low fender configurations, the hitch must wrap around the fender for support thus being very visible and unsightly.

The motorcycle enthusiast wants the motorcycle to have its clean lines and classic form. Trailers are occasionally needed or wanted to carry extra gear, such as  
5 for camping. However, to enable the attachment of a trailer, a hitch must be mounted.

The mounting process must include mounting to the frame or major support points and often requires major disassembly or removal of the rear wheel. This is a major undertaking and thus, once the hitch is installed it is not easily removed. Thus  
10 the hitch becomes an almost permanent fixture on the motorcycle. The result is that the majority of the time that the motorcycle is used, the unused hitch is highly visible.

The hitches, as a result, become an unwanted accessory for most of the time.

#### **SUMMARY OF THE INVENTION:**

The object of the present invention allows for a hitch to be fitted onto a motorcycle without the necessity of having the hitch detract from the fender and rear end of the motorcycle. In the subject invention, the attach points can fit inside or outside the fender. The hitch assembly can be nested under and inside the rear portion of the fender and thus not readily visible. In other configurations, such as with  
15 fat tires, the attachment is on the outside of the fender but due to the design it blends outside the fender. The connection of the bob tail hitch to the tongue of the trailer is completed with a goose neck attachment. This allows proper attachment and  
20 the freedom of movement between the trailer and the motorcycle around the hitch ball

or point and keeps the trailer tongue at the proper height. In other types of fenders, the assembly places the hitch ball at the right height.

An alternate design also allows the hitch attachment points to be inside the fender and when not in use the hitch ball can be removed, thus belying the fact that 5 the motorcycle has a trailer hitch capable attachment installed. In this version, the hitch ball is removably attached to the hitch frame assembly by a pin and lock pin assembly. When not in use, the ball is removed, leaving only the original fender visible.

10 **DESCRIPTION OF THE DRAWINGS:**

**Figure 1** A perspective view of one version of the hitch assembly for a bob tail installation with top notches to accommodate turn signals.

**Figure 2** A perspective view of the rear of the motorcycle with a version of the bob tail hitch assembly installed inside of the fender.

15 **Figure 3** A view of the rear wheel of a motorcycle with a bob tail showing the hitch assembly installed inside of the fender.

**Figure 4** (a & b) Top and side views of the goose neck extension to allow the bob tail hitch to be connected to the trailer.

20 **Figure 5** A perspective view of another version of the hitch assembly with a removable ball hitch.

**Figure 6** A view of the rear wheel of a motorcycle showing Fig. 5 version installed.

**Figure 7** Another view of the rear wheel of a motorcycle with Fig. 5's version installed.

DETAILED DESCRIPTION OF THE INVENTION:

5 The subject invention is an assembly made from structural steel or other suitable material that is able to withstand the vibration and weight bearing of the towing of motorcycle trailers and is attached to the main frame components with common fasteners such as the bolts used to attach the fender to the frame.

The assembly of the first embodiment is shown in Fig. 1. It is comprised of two 10 (2) substantially parallel side ribs (12 and 14) for attaching to the rear fender frame of the motorcycle. At the rear most part of the assembly is a cross-piece (16) to which the hitch ball is installed, to match with the tow bar attachment means of the trailer. The cross-piece (16) may be an extension of the side ribs (12 and 14) and thus of unitary construction, or separate construction by a cross piece welded to each 15 rib or attached by any suitable means such as removable pins, bolts or screws. Fig. 3 shows a perspective view of the rear of a motorcycle with the side of the fender cut away to expose one side of the rear frame (30) with the three (3) bolts by which the concurrent side of the fender is attached to the side of the frame before any hitch assembly is installed. On each side of the rear frame, in addition to the three (3) bolt 20 holes used to attach the fender, a fourth hole (40), in this version, is located near the rear most part of the frame which is used to attach the hitch assembly..

The assembly, Fig. 1, for each side rib shows a forward notch (20) to fit over and engage the corresponding bolt shaft used to attach the fender and frame at the point (32) in Fig. 3. The same would occur on the other side rib. The forward notch is such as to slip into a space between the head of the bolt and the frame when the 5 bolt is loosened. It is intended that there need not be removal of the bolt to slip the end notch into the spacing created when loosened. The notch on top, if present, of the two (2) ribs at 24 and 26 similarly fits into a similar spacing, created when the bolts in position 34 are loosened, also without the necessity of removing the bolts.

The top notches, 24 and 26 can be wide enough to accommodate, in addition 10 to the bolts, side turn signal supports and their wiring that are sometimes installed at this location. In this configuration for bob tail bikes, the third hole in each side rib, 28 and 29 are aligned with the second most rearward holes on the corresponding sides of the frame (40). They are attached to the frame with suitable common attachment means, including lock or anti-loosening means on bolts.

15 The first embodiment can be mounted on the inside or the outside of the fender as in Fig. 2. Other than the cross piece 16 and the ball hitch, no portion of the hitch assembly is readily visible Fig. 3 when the ribs are located inside the fender.

In installations on bob tail motorcycles, where the ball hitch is high, in order to attach the tongue of the trailer to the ball hitch and keep the freedom of turning and movement, the normal trailer will need a goose neck extension such as in Fig. 4.

The lower connecting point (47) connects to the tongue. The upper connecting 5 point (49) then connects to the hitch socket on the ball hitch in the normal fashion. The angle of incline is approximately 45° and the length is as shown in Fig. 4 but can vary depending on the particular motorcycle or trailer.

The preferred embodiment is shown on Fig. 4 with square channel constructed with attachment means, well known in the industry, over one end to the tongue and 10 the other to the bolt hitch assembly.

The second embodiment is for a removable ball so the hitch assembly would not be readily viewable once the ball is removed.

In Fig. 5 the configuration shown would be for regular fender types, with the rear portion extending further in back of the rear wheel than the bob tail of the first 15 embodiment and Fig. 2 and Fig. 3. However the removable ball can be used on the embodiment 1 by merely incorporating the cross-piece and removable attachment means of the hitch assembly of embodiment 2 to embodiment 1 and removing the cross-piece and ball of embodiment 1. The other difference in embodiment 2, other than the two (2) side ribs extending further and the cross piece difference, is the top 20 notch 42 and 43. Figure 5 is an alternative that can be selected if no turn signals are located at this junction. As for the side ribs 44 and 46, they must be long enough to

Express Mail No. EL078280365US

Docket No. S123P

extend to the lowest end of the rear fender as show in Fig. 6 and Fig. 7. When the ball is attached as shown in Fig. 5, it extends down from the rear fender and is available for attachment to the tongue of the trailer. The portion of the hitch assembly, other than the removable ball, can be nested within the rear fender as 5 shown in Fig. 6 and Fig. 7.

CLAIMS:

What I claim is:

1. An assembly for a trailer hitch for a motorcycle that is comprised of the 10 following:
  - a. A first side that removably attaches to one side of the rear frame inside the rear fender,
  - b. a second side that removably attaches to the opposite side of the rear frame inside the rear frame,
  - c. a cross piece that connects the first and second side at the rear 15 end of the first and second sides, and
  - d. a ball hitch that removably attaches to the cross piece to tow a trailer.

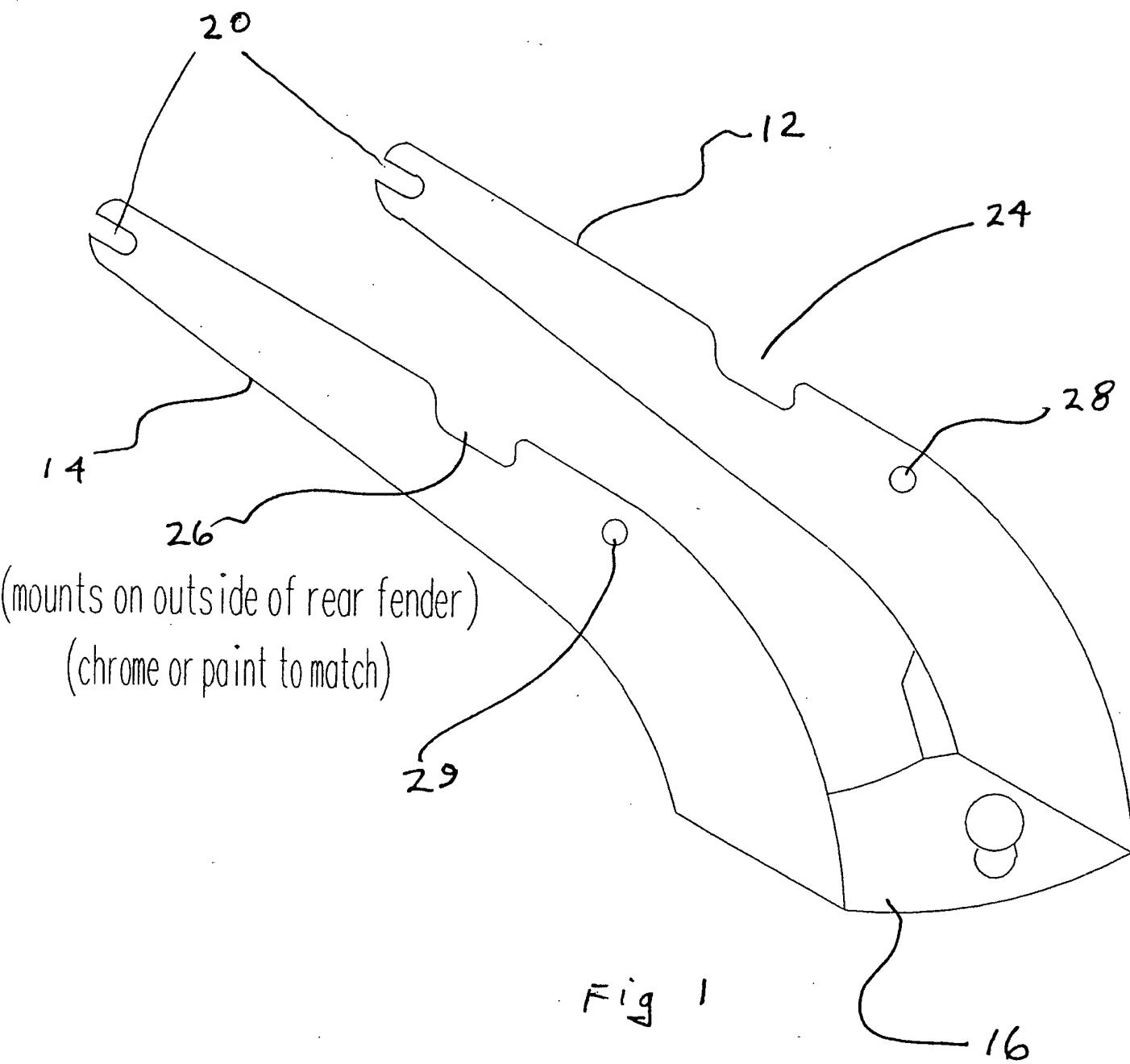
20

ABSTRACT

An assembly to mount a trailer hitch on to the frame of a motorcycle to minimize or eliminate the assembly's visibility. The assembly includes two (2) support ribs to connect to the frame and a cross piece to which the ball hitch is attached.



# GHOST HITCH



Harley-Davidson(R) FXST Hitch Assembly



جامعة الملك عبد الله للعلوم والتقنية

P. 63

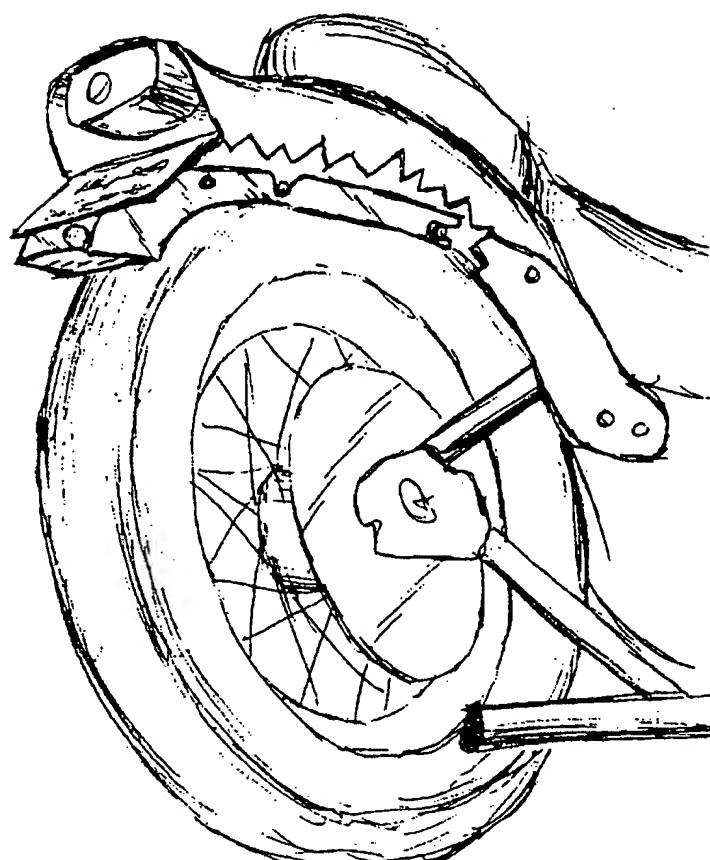


Fig 2

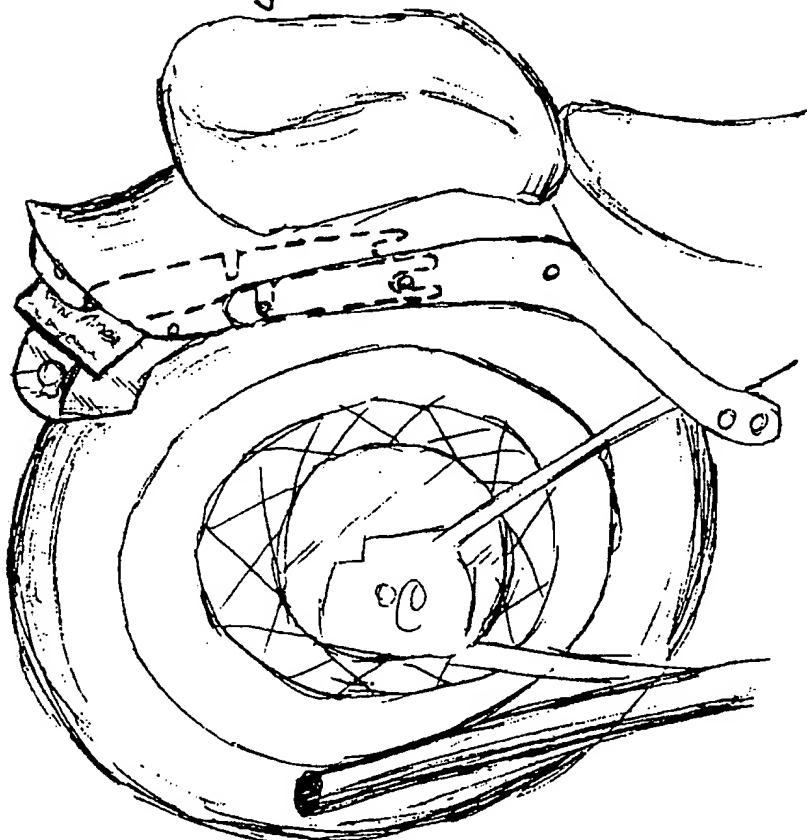
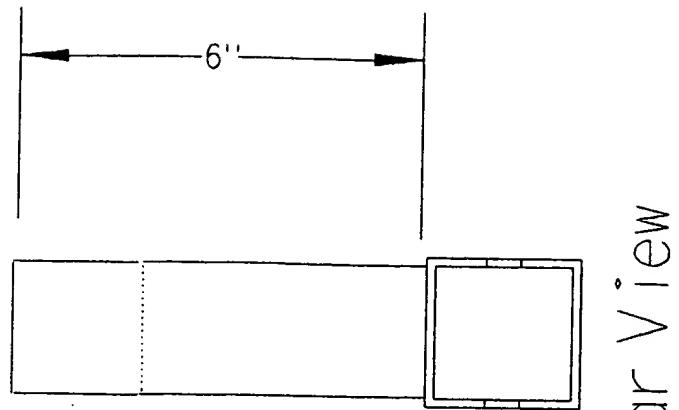
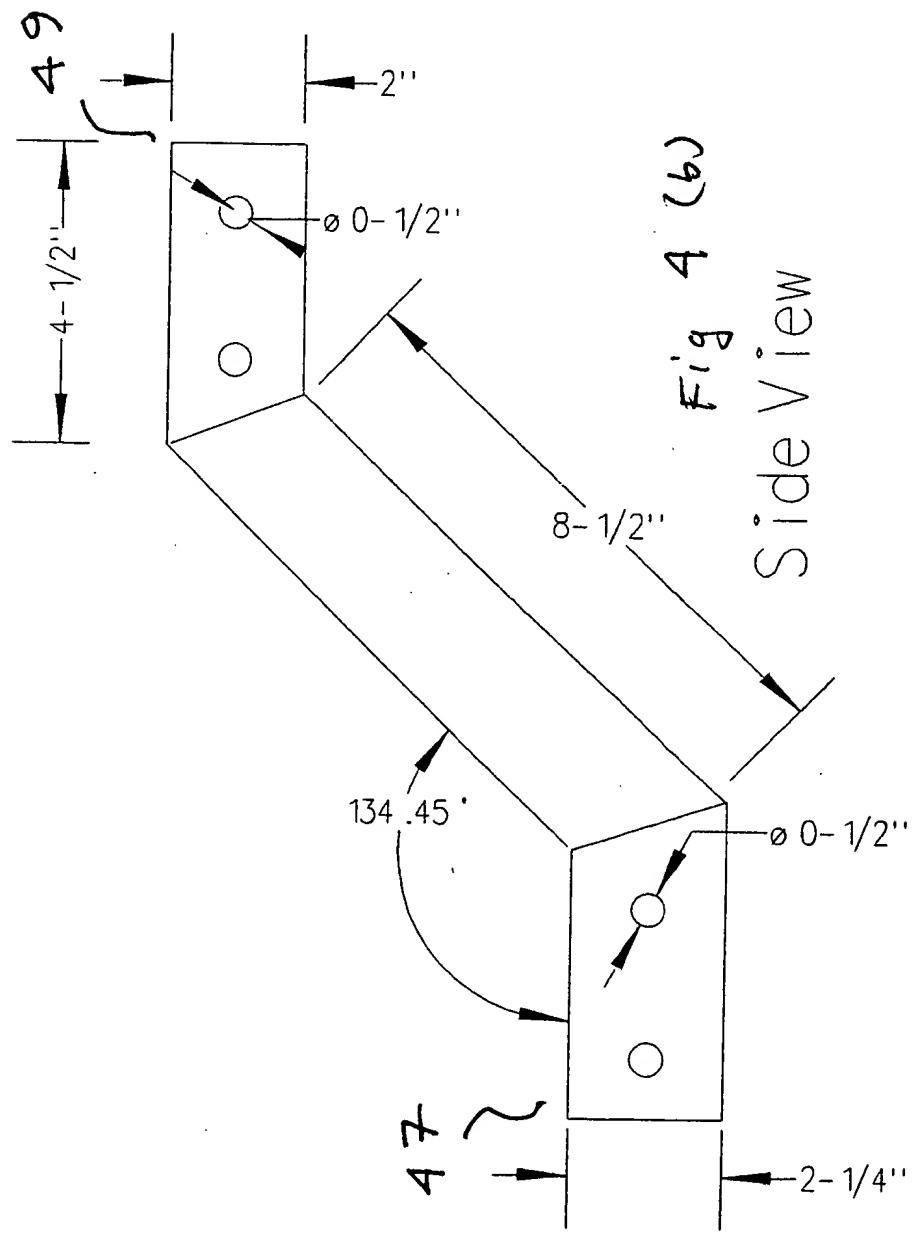
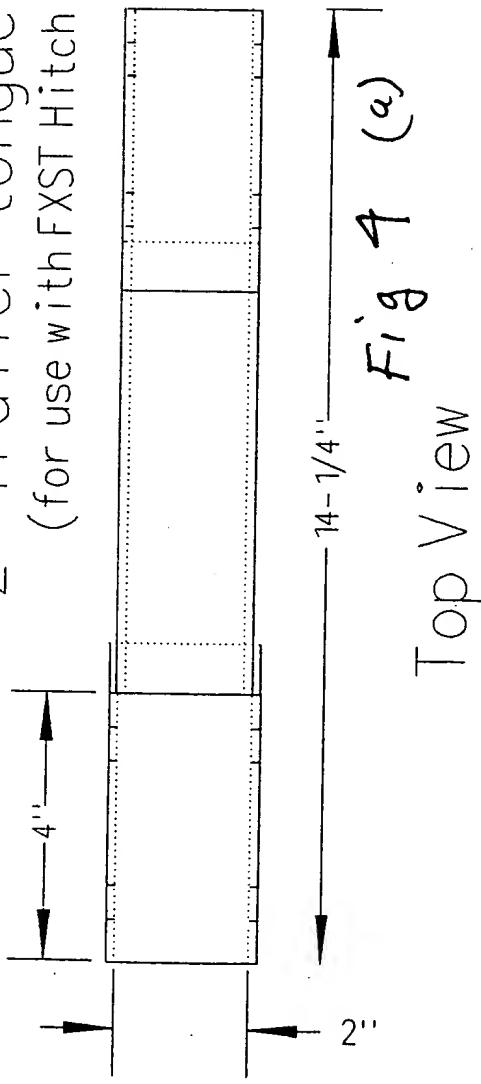


Fig 3

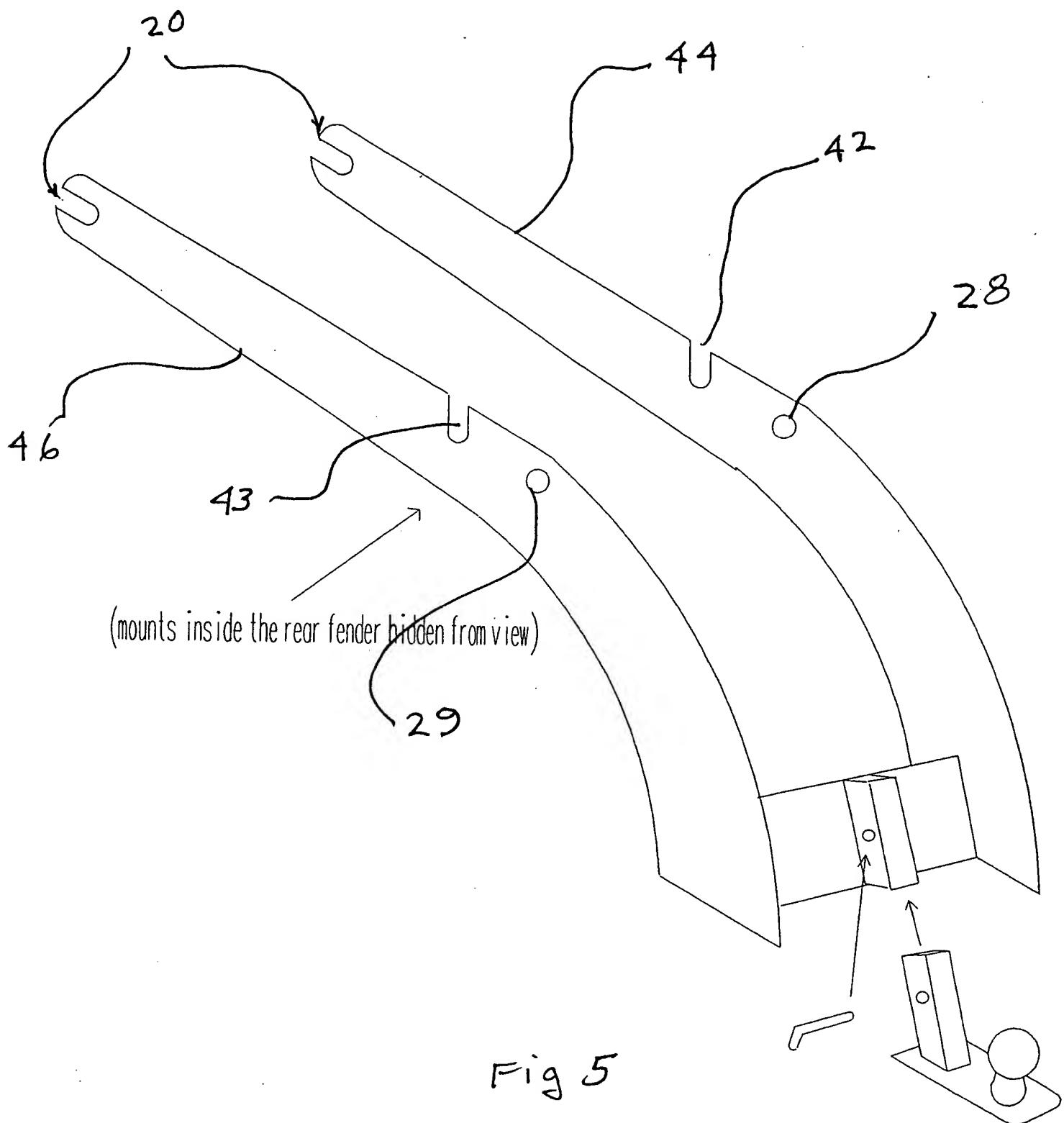


2" Trailer tongue Gooseneck  
(for use with FXST Hitch assembly)





# GHOST HITCH



Harley-Davidson(R) FLST Hitch Assembly

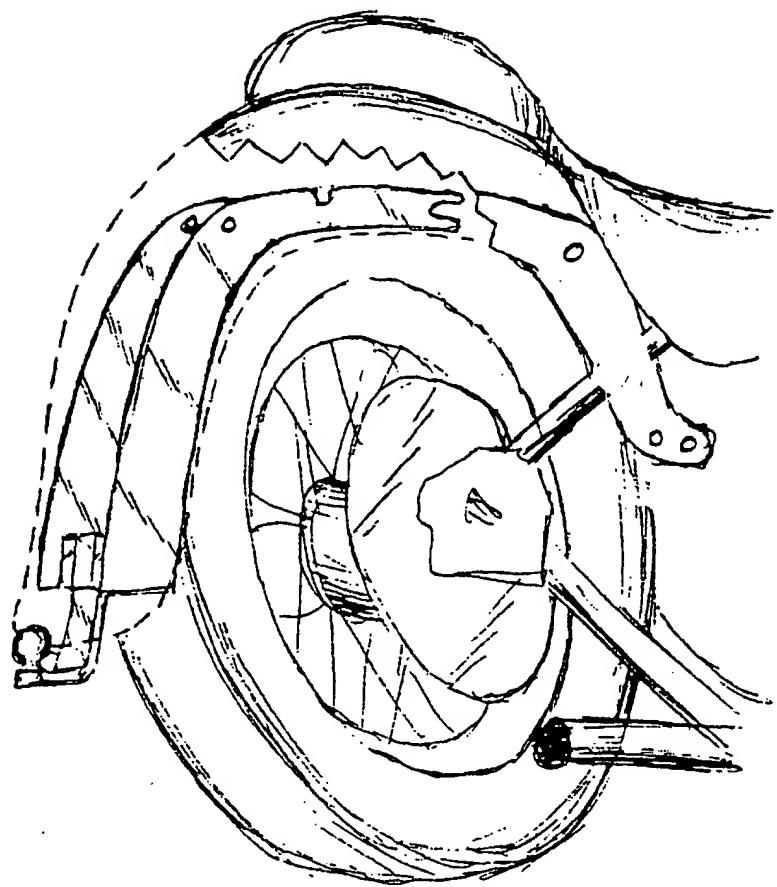
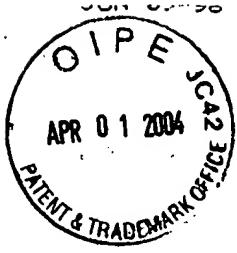


Fig 6

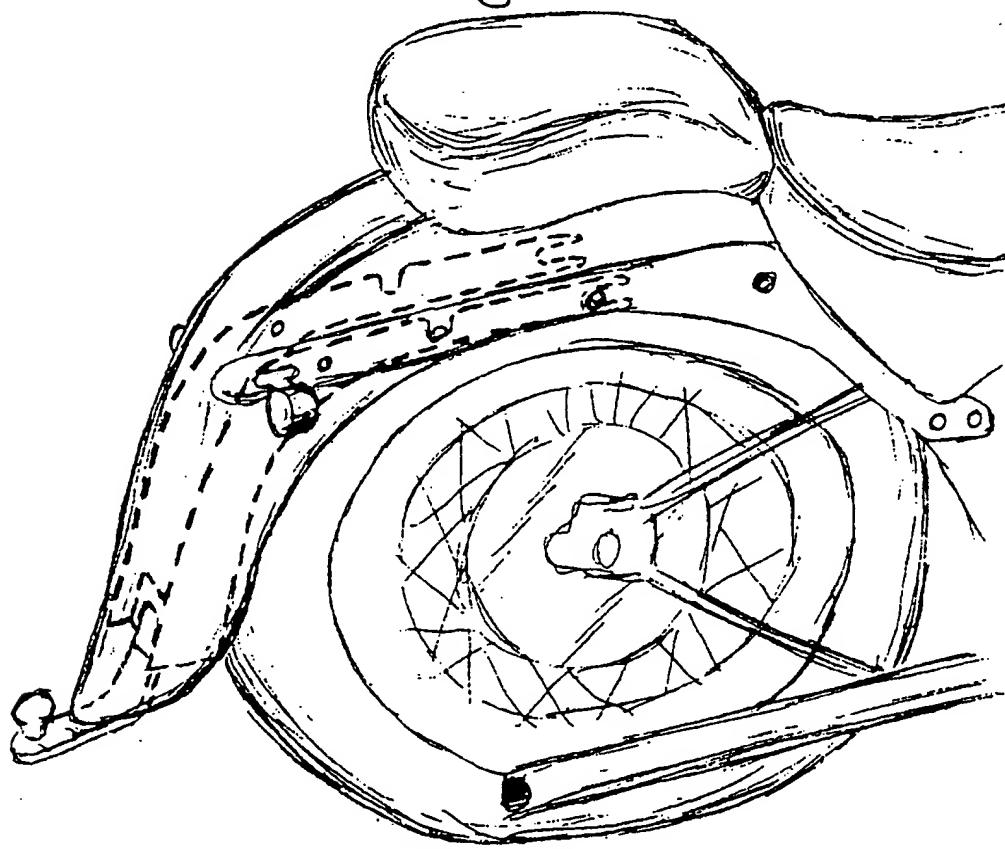


Fig 7